*BY ORDER OF THE*
*SECRETARY OF THE AIR FORCE*

*AFMS 38A3D0*
*6 October 1995*

*Manpower Standard*

# *AIR FORCE SATELLITE COMMUNICATIONS (AFSATCOM) SYSTEMS MAINTENANCE*

This Air Force Manpower Standard (AFMS) quantifies the manpower required to maintain an Ultra High Frequency (UHF), low rate data, satellite communications system in support of the National Military Command Authorities and the Commander-In-Chief (CINC) Strategic Command (STRATCOM). The AFSATCOM system was specifically designed for emergency action message dissemination, force direction, force report back, and CINC internetting. The 21 series of Air Force and command directives contains policy and procedural guidance for the USAF Satellite Communications Systems element. This element was developed in accordance with policy and procedures contained in AFMAN 38-208, *Air Force Management Engineering Program (MEP)*. This element applies to all units having this work center during peacetime operations **except**: Combat Communications units, Air National Guard, Air Force Reserve units, and locations undergoing or having undergone AFI 38-203 cost comparison studies. Also, this AFMS does not apply to locations in which the maintenance responsibility for the AN/GSC-42 belongs to Ground Base Radio Maintenance, FAC 38A1F0. Send comments and suggested improvements on AF Form 847, **Recommendation for Change of Publication**, through channels, to AFMEA/AEDA, 550 E Street East, Randolph AFB, Texas 78150-4451.

**NOTE:** A positive or negative variance must be developed for all work within an organization that has undergone a cost comparison study.

**1. Composition.** The following factors were considered to determine the manpower requirement for AFSATCOM Systems Maintenance:

1.1. Level of service required to maintain continuous operations is 8 hours per day, 5 days per week with on-call status for emergency outages.

1.2. A minimum crew size of two (2) is required to maintain an AFSATCOM terminal.

1.3. Indirect work involves those tasks that are not readily identifiable with the work center's specific product or service. The major categories of standard indirect work are Supervision, Administration, Meetings, Training, Supply, Equipment Maintenance, and Cleanup. [Refer to AFMS 00AA (Standard Indirect Description) for more detail.] Man-hours for indirect work are computed in with equipment processes.

1.4. Restoral priorities will be established and followed when personnel respond to multiple outages.

**2. Standard Data:**

2.1. **Approval Date.** 1 September 1994.

2.2. **Man-hour Data Source.** Expert Team.

2.3. **Manpower Equation:**

Yc = 46.08 + 182.068(X1) + 21.761(X2) + 14.507(X3)

Yc = 482.1 (minimum manpower)

2.4. **Workload Factors (WLF):**
2.4.1. **Titles:**
2.4.1.1. **X1.** An AN/GSC-44 Consolidated Ground Terminal (CGT).
2.4.1.2. **X2.** An AN/GSC-42 Single Wing Command Post (SWCP).
2.4.1.3. **X3.** An AN/FRC-175 Launch Control Center (LCC).
2.4.2. **Definitions:**

OPR: AFMEA/AEDA (Mr. Glen Craft)
Certified by: AFMEA/AED (Lt Col Terry Holtz)

Pages: 8/Distribution: F

2.4.2.1. **X1.** The number of AN/GSC-44 Satellite Terminals maintained.
2.4.2.2. **X2.** The number of AN/GSC-42 Satellite Terminals maintained.
2.4.2.3. **X3.** The number of AN/FRC-175 Satellite Terminals maintained.
2.4.3. **Source. X1 through X3.** C-E Equipment Inventory List and/or physical inventory.

2.5. **Points of Contact:**
2.5.1. **Functional Representative.** MSgt Harwood, AFC4A/SYXM.
2.5.2. **AFMEA Representative.** Mr. Glen Craft, AFMEA/AEDA, DSN 487-2479.

**3. Application Instructions:**

3.1. The Application Worksheet at Attachment 3 must be completed to determine manpower requirements. See Attachment 3 for complete instructions.

3.2. Use the appropriate man-hour availability factor (MAF) to find the fractional manpower requirement (AFI 38-201).

3.3. Use current rounding rules to determine whole manpower requirements.

3.4. Earned authorizations from the standard man-hour equation may not provide adequate manpower coverage for 8 hours a day, 5 days a week support. To determine required minimum authorizations, apply the minimum manpower equation in Figure 1.1.

$$\frac{(5\ Days/Wk)(8\ Hrs/Day)(4.348\ Wks/Mo)}{(160.7)}(2) = \frac{173.920}{160.7}(2) = 2.16 = 3$$

**Figure 1.1. Minimum Manpower Equation.**

3.5. Compute both the standard man-hour equation and the minimum manpower computation. Select the larger of the whole manpower requirements.

3.6. Refer to Attachment 2, Standard Manpower Table, for applicable AFSCs and grades.

**4. Statement of Conditions (SOC).** This element has environmental conditions that impact the work center's ability to perform processes identified in the Work Center Description (Attachment 2). Specific conditions have been incorporated in the computations of the manpower standard and are identified below:

4.1. **Climatic Conditions.** Extreme hot or cold temperatures impact the maintenance time on equipment as well as the frequency of repair actions. Snow and ice cause certain tasks to be done more frequently. Rain and humidity impact the frequency of corrosion control performed on equipment.

4.2. **Non-automated Tools and Equipment.** This work center is impacted by non-automated tools and equipment as listed in Table of Allowances (TA) 667.

4.3. **Physical Condition of Facility.** The age of the shelters in which the equipment is located directly impacts the frequency of the maintenance category of work.

4.4. **Directed Performance Standards.** Technical Orders (TOs) and work cards contain directed performance standards for tasks performed by this element. These standards were used in determining frequency of maintenance for PMIs.

BENJAMIN N. CHAPMAN, Lt Col, USAF
Chief, Plans and Productivity Division

Attachments:
l. Process Oriented Description
2. Standard Manpower Table
3. Application Worksheet
4. Variances

**PROCESS ORIENTED DESCRIPTION**

**AIR FORCE SATELLITE COMMUNICATIONS (AFSATCOM) SYSTEMS MAINTENANCE**

**A1.1. CHECKS SYSTEM STATUS.** Checks equipment operation, configuration, and power distribution.

**A1.2. INITIATES REQUIRED CORRECTIVE ACTION.** Reconfigures equipment as required, coordinates with appropriate agency, completes documentation, and resumes operation. Coordinates equipment swap with Operations, opens job with Job Control, logs equipment swap and job, annotates job board, logs job in job control number (JCN) book, completes job ticket, and updates the Core Automated Maintenance System (CAMS).

**A1.3. PERFORMS PREVENTIVE MAINTENANCE INSPECTIONS (PMIs).** Obtains and reviews preventive maintenance schedule, work card, or other technical information to determine required tools and test equipment. Notifies monitoring facility and Maintenance Control of anticipated action, and requests equipment release. Gathers tools, technical information, forms, and test equipment, obtains and prepares vehicle, loads material onto vehicle, and transports to equipment location. Unloads material from vehicle, notifies monitoring facility and Maintenance Control of arrival, sets up test equipment, locates specific technical data reference, observes, records, and analyzes readings, visually inspects equipment for malfunctions and indications of corrosion, returns equipment to normal configuration, and notifies monitoring facility of completed action. Breaks down test equipment, gathers tools, technical information, forms, and test equipment, and loads material onto vehicle. Unloads tools, technical information, forms, and test equipment, cleans and stores material, and returns and signs in vehicle. Notifies Maintenance Control of completed action, accomplishes Maintenance Data Collection (MDC), Equipment Status Reporting (ESR), and historical documentation, inputs data into Core Automated Maintenance System (CAMS) or REMIS, analyzes data for Facility Status Record, and fills out appropriate forms to indicate completed action.

**A1.4. PERFORMS EQUIPMENT REPAIR.** Acknowledges notification by phone, radio, or paging system, and queries individual for pertinent information. Gathers tools, technical information, forms, and test equipment, obtains and prepares vehicle, and loads material onto vehicle. Notifies monitoring facility and Maintenance Control of arrival and initial assessment of problem. Unloads and sets up test equipment, troubleshoots to isolate problem, and notifies Job Control of the problem. Requests technical assistance. Obtains part, dissembles, cleans, and replaces defective part, tests and adjusts system, and returns equipment to normal configuration. Breaks down test equipment, gathers tools, technical information, forms, and test equipment, and loads material onto vehicle. Unloads tools, technical information, forms, and test equipment, cleans and stores material, and returns and signs in vehicle. Notifies Maintenance Control of completed action, accomplishes MDC, ESR, and historical documentation, inputs data into CAMS or REMIS, analyzes data for Facility Status Record, and fills out appropriate forms to indicate completed action.

**A1.5. PERFORMS EQUIPMENT MODIFICATION.** Obtains and reviews Time Compliance Technical Order (TCTO) or Communications Equipment Modification Instruction (CEMI) direction and technical data to determine requirement. Notifies monitoring facility and Maintenance Control of anticipated action, and requests equipment release. Gathers necessary tools, parts (TCTO kit), test equipment and servicing material, obtains and prepares vehicle, loads tools, parts, test equipment and servicing material onto vehicle. Unloads material from vehicle, notifies monitoring facility and Maintenance Control of arrival, sets up material, disassembles, reconfigures, cleans, and assembles part, tests and adjusts system, returns equipment to normal configuration, and notifies monitoring facility of completed action. Breaks down test equipment, gathers tools, technical information, forms, and test equipment, and loads material onto vehicle. Unloads tools, technical information, forms, and test equipment, cleans and stores material, and returns and signs in vehicle. Notifies Maintenance Control of completed action, accomplishes Maintenance Data Collection (MDC), Equipment Status Reporting (ESR), and historical documentation, inputs data into CAMS or REMIS, analyzes data for Facility Status Record, and fills out appropriate forms to indicate completed action.

**A1.6. RESPONDS TO EQUIPMENT MALFUNCTION IN ON-CALL STATUS.** Travels from domicile to place of duty to perform unscheduled maintenance after normal duty hours and on weekends. Returns to domicile.

**A1.7. PERFORMS EQUIPMENT PARTS ACQUISITION.** Researches and orders parts associated with equipment preventive maintenance, repair, and modification (includes completing AF Form 2005 and the DD Form 2413 supply log). Updates job ticket, MSL, job status board, and CAMS. Checks status of parts on backorder. Receives part, verifies correctness of part, updates status to concerned parties. Completes turn in documentation for Due-In-From-Maintenance (DIFM) parts [includes 2 green tags, AFTO 350 tag, Not Repairable This Station (NRTS) letter, DD-1348-1, and turn-in (TIN) 2005].

**STANDARD MANPOWER TABLE**

| **WORK CENTER/FAC** | | | **APPLICABILITY MAN-HOUR RANGE** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Air Force Satellite Communications Systems Maintenance/38A3DO | | | | | | | | | | | |
| **AIR FORCE SPECIALTY TITLE** | **AFSC** | **GRADE** | **MANPOWER REQUIREMENT** | | | | | | | | |
| Sat & Wideband Comm Eqp Cftman | 2E171 | TSG | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Sat & Wideband Comm Eqp Jnyman | 2E151 | SSG | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Sat & Wideband Comm Eqp Jnyman | 2E151 | SRA | | 1 | 1 | 2 | 2 | 2 | | | |
| Sat & Wideband Comm Eqp Appr | 2E131 | A1C | | | 1 | 1 | 2 | 3 | | | |
| **TOTAL** | | | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| **AIR FORCE SPECIALTY TITLE** | **AFSC** | **GRADE** | **MANPOWER REQUIREMENT** | | | | | | | | |
| | | | | | | | | | | | |
| **TOTAL** | | | | | | | | | | | |

AF Form 1113, JUN 91 (COMPUTER GENERATED). PREVIOUS EDITION IS OBSOLETE.

**APPLICATION WORKSHEET**

**AIR FORCE SATELLITE COMMUNICATIONS (AFSATCOM) SYSTEMS MAINTENANCE**

INSTRUCTIONS: Complete each applicable section of this worksheet. Earned authorizations from the standard man-hour equation may not provide adequate manpower coverage for 8 hour a day, 5 day a week support. Therefore, compute both the earned man-hour computation (SECTIONS 1 thru SECTION 4) and the minimum manpower computation (SECTIONS 5 and SECTION 6) and select the larger of the whole manpower requirements (SECTION 7).

SECTION 1. EQUIPMENT MAN-HOUR CALCULATIONS: Determine the type/number of AFSATCOM equipment items and compute TOTAL EQUIPMENT MAN-HOURS using the following outline. Refer to paragraph 2.4 of the basic AFMS for definitions and sources of count for WLF NUMBERS X1 - X3.

| WLF NUMBER | EQUIPMENT ITEM | EQUIPMENT QTY | X | EQUIPMENT VALUE | = | EQUIPMENT MAN-HOURS |
|---|---|---|---|---|---|---|
| X1 | AN/GSC-44 CGT | _____ | | 182.068 | | _____ |
| X2 | AN/GSC-42 SWC | _____ | | 21.761 | | _____ |
| X3 | AN/FRC-175 LCC | _____ | | 14.507 | | _____ |
| SUMMATION: | | | | X1+X2+X3 | = | _____ |

Add 46.08 to the sum of the workload factors to get the Total Equipment Man-Hours: + 46.08

TOTAL EQUIPMENT MAN-HOURS: _____

SECTION 2. TRAVEL VARIANCE MAN-HOUR CALCULATIONS: Compute TOTAL VARIANCE MAN-HOURS using the following outline. Refer to Attachment 4 variance definition.

Title. Missile Field Travel.

(Calculation: Determine the average number of miles traveled per month and multiply that by .1059. Add 6.803 to the results.)

_____ X .1059 = _____ + 6.803 = _____

SECTION 3. ADDITIONAL VARIANCES: Determine other workload variances not identified above and compute TOTAL ADDITIONAL VARIANCE MAN-HOURS as appropriate using the following outline. If equipment value is not identified in another AFMS (e.g., Ground (Base) Radio Maintenance), then contact the Base Manpower Office for guidance.

| VARIANCE TITLE | EQUIPMENT QTY | X | EQUIPMENT VALUE | = | EQUIPMENT MAN-HOURS |
|---|---|---|---|---|---|
| | _____ | | _____ | = | _____ |
| | _____ | | _____ | = | _____ |
| | _____ | | _____ | = | _____ |
| | _____ | | _____ | = | _____ |
| | _____ | | _____ | = | _____ |

TOTAL ADDITIONAL VARIANCE MAN-HOURS:_____

SECTION 4. **EARNED WHOLE MANPOWER CALCULATIONS**

A SECTION 1 - TOTAL EQUIPMENT MAN-HOURS _____

B SECTION 2 - TOTAL TRAVEL VARIANCE MAN-HOURS _____

C SECTION 3 - TOTAL ADDITIONAL VARIANCE MAN-HOURS _____

D Sum SECTION 4A thru C to determine TOTAL MAN-HOURS _____

E Divide TOTAL MAN-HOURS by the appropriate MAF to determine FRACTIONAL MANPOWER: _____

F Use current rounding rules to determine **WHOLE MANPOWER** _____

SECTION 5. **MINIMUM MANPOWER CALCULATIONS**: Determine minimum man-hours based on the minimum crew size required to operate/maintain an AFSATCOM terminal(s).

A. **MINIMUM MAN-HOURS FOR AFSATCOM MAINTENANCE TERMINAL**: (Calculation: Multiply 2.165 (the minimum number of authorizations as referred to in paragraph 3.4 of the basic standard) by the appropriate MAF.)

2.165 X _____ = _____

B. SECTION 2 **TOTAL TRAVEL VARIANCE MAN-HOURS:** _____

C. SECTION 3 **TOTAL ADDITIONAL VARIANCE MAN-HOURS:** _____

D. Sum SECTION 5.A. thru C. to determine **TOTAL MAN-HOURS:** _____

E. Divide **TOTAL MAN-HOURS** by the appropriate MAF to determine:

**FRACTIONAL MANPOWER** _____

F. Use current rounding rules to determine **WHOLE MANPOWER**: _____

SECTION 6. **WHOLE MANPOWER COMPARISON**. Compare **SECTION 4** WHOLE MANPOWER to

**SECTION 5** WHOLE MANPOWER and select the larger of the two.

**SECTION 4 WHOLE MANPOWER _____**

**SECTION 5 WHOLE MANPOWER** _____

**VARIANCES**

**AIR FORCE SATELLITE COMMUNICATIONS (AFSATCOM) SYSTEMS MAINTENANCE**

**A4.1. Title.** Positive Mission Variance for Missile Field Travel.

A4.1.1. **Definition.** The average number of miles traveled per month to missile field to perform maintenance and/or repair on AFSATCOM equipment. Average number of miles are calculated over a 12month period; mileage information can be found in the work center Vehicle Sign-In Log.

A4.1.2. **Impact:**

| LOCATION | UNIT | MONTHLY MAN-HOURS |
|---|---|---|
| Grand Forks AFB ND | 319 CS | 2317.45 |
| Malmstrom AFB MT | 43 CS | 1980.00 |

A4.1.3. **Applicability.** This variance applies to AFSATCOM Maintenance work centers that must travel to perform maintenance responsibilities.

**A4.2. Title.** Positive Mission Variance for Mystic Star/Remote Switching Units (RSU).

A4.2.1. **Definition.** Maintenance of Mystic Star/RSU equipment consists of accomplishing PMIs, repairing equipment malfunctions, modifying equipment, ordering parts, and completing appropriate documentation. Operation encompasses performing maintenance test configuration, performing warm or cold boot of system CPU, verifying SATCOM links, coordinating with Network Control Station (NCS), and reviewing/analyzing transmission and reception technical data.

A4.2.2. **Impact:**

| LOCATION | UNIT | MONTHLY MAN-HOURS |
|---|---|---|
| Brandywine AFB MD | Det 2, 89 CG | 364.136 |

A4.2.3. **Applicability.** This variance applies to AFSATCOM Maintenance work centers that have Mystic Star/RSU maintenance responsibilities.

**A4.3. Title.** Positive Mission Variance for AN/URM-205 Test Bench Maintenance.

A4.3.1. **Definition.** Maintenance of AN/URM-205 test bench maintenance equipment encompasses accomplishing PMIs, repairing equipment malfunctions, modifying equipment, ordering parts, and completing the appropriate documentation.

A4.3.2. **Impact:**

| LOCATION | UNIT | MONTHLY MAN-HOURS |
|---|---|---|
| Brandywine AFB MD | Det 2, 89 CG | 6.00 |
| Malmstrom AFB MT | 43 CS | 6.00 |

A4.3.3. **Applicability.** This variance applies to AFSATCOM Maintenance work centers that have AN/URM-205 Test Bench Maintenance responsibilities.